

REMARKS

Reconsideration is respectfully requested. Claim 1 is present in the application and is amended. New claim 2 is added.

The abstract is objected to. Applicant cancels the previously submitted version of the abstract and substitutes a version closely following the abstract in the WO publication, modified to remove the word "said".

Applicants note the Examiner's communication regarding the need to insert the registration symbol "®" on page 6 by the trade name Varimax. The specification is amended to include the registration symbol.

Claim 1 is rejected under 35 U.S.C. §102(b) as allegedly being anticipated by INSTITUT MEDIKO-BIOLOGICHESKIKH PROBLEM (RU 205051). Applicant respectfully traverses.

Claim 1 is rejected under 35 U.S.C. §102(b) as allegedly being anticipated by applicant's admission. Applicant respectfully traverses.

Applicant respectfully submits that the art relied on neither teaches nor suggests claim 1 and in view of this, claim 1 is respectfully submitted to be allowable.

The cited reference discloses the use of carphedon as a nootropic agent. The subject application is directed to the use of N-carbamoyl-methyl-4-phenyl-2-pyrrolidone, also known as

carphedon or phenotropyl (or phenotropil), for use in the treatment of depression. Although there may be a relationship between the two uses, it is respectfully submitted that the use claimed for carphedon in the subject application is distinct from that disclosed in the cited reference.

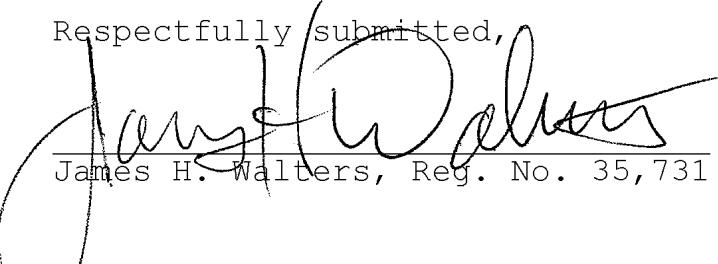
Applicants submit herewith an excerpt from the Wikipedia Internet Site which is directed to the term "nootropic". As the Examiner will note, the article identifies a plurality of possible nootropic uses for a number of compounds and medicaments. On pages 6- 7 of the attached article, the compound carphedon is recited as an agent for improving mental agility, concentration, stamina and focus. The Wikipedia Internet Site also discloses information about carphedon (see attached excerpt). It reports that clinical studies indicate that it might be useful in treating certain encephalopathic conditions and provide increased physical stamina and improved tolerance to cold. The Derwent Abstract of the cited reference reports that the compound has psycho-stimulating and anti-convulsive effects. It is respectfully submitted that these known uses, which are included within the scope of "nootropic" uses, are readily distinguishable from use as an antidepressant. In particular, it is respectfully submitted that there is a qualitative difference between the treatment of symptoms which may lead to depression and the treatment of depression per se. The applicants have discovered a new use of the compound N-carbamoyl-methyl-4-phenyl-

2-pyrrolidone, namely use in the treatment of depression, which is distinguishable from the uses disclosed in the cited reference, namely the nootropic improvement in intellectual function.

In light of the above noted amendments and remarks, this application is believed in condition for allowance and notice thereof is respectfully solicited. The Examiner is asked to contact applicant's attorney at 503-224-0115 if there are any questions.

It is believed that no fees are due with this filing. However, if additional fees are required to keep the application pending, please charge deposit account 503036. If fee refund is owed, please refund to deposit account 503036.

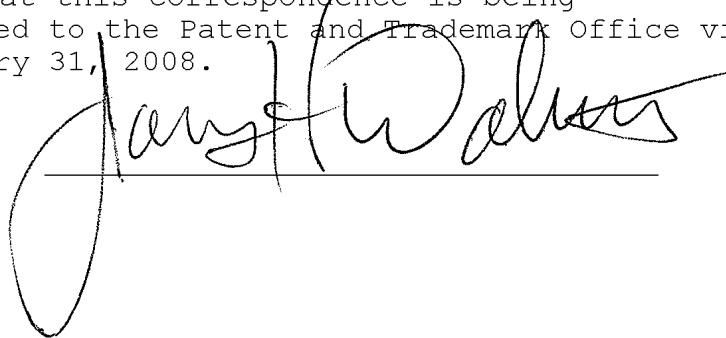
Respectfully submitted,

  
James H. Walters, Reg. No. 35,731

Customer number 802  
patenttm.us  
P.O. Box 82788  
Portland, Oregon 97282-0788 US  
(503) 224-0115  
DOCKET: V-322

Certification of Electronic Transmission

I hereby certify that this correspondence is being electronically transmitted to the Patent and Trademark Office via the EFS system on this January 31, 2008.



# Nootropic

From Wikipedia, the free encyclopedia

**Nootropics**, popularly referred to as "**smart drugs**", "**smart nutrients**", "**cognitive enhancers**" and "**brain enhancers**", are substances which claim to boost human cognitive abilities (the functions and capacities of the brain). The word **nootropic** was coined in 1964 by the Romanian Dr. Corneliu E. Giurgea, derived from the Greek words *noos*, or "mind," and *tropein* meaning "to bend/turn". Typically, nootropics are alleged to work by increasing the brain's supply of neurochemicals (neurotransmitters, enzymes, and hormones), by improving the brain's oxygen supply, or by stimulating nerve growth.

Most alleged nootropic substances are nutrients or plant components (herbs, roots, beans, bark, etc.), available over the counter at health food and grocery stores, and are used as nutritional supplements. Some nootropics are drugs, used to treat people with cognitive learning difficulties, neural degradation (Alzheimer's disease or Parkinson's disease), and for cases of oxygen deficit to prevent hypoxia. These drugs have a variety of human enhancement applications as well, are marketed heavily on the World Wide Web, and are used by many people in personal cognitive enhancement regimens.

While scientific studies support some of the claimed benefits, it is worth noting that many of the claims attributed to most nootropics have not been formally tested.

## Contents

- 1 General strategies
- 2 Nootropic substances
  - 2.1 Replenishing and increasing neurotransmitters
    - 2.1.1 Cholinergics
    - 2.1.2 Dopaminergics
    - 2.1.3 Serotonergics
  - 2.2 Anti-depression, adaptogenic and mood stabilization
  - 2.3 Brain energy and improved oxygen supply
  - 2.4 Mental agility, concentration, stamina, and focus
  - 2.5 Purported memory enhancement and learning improvement
  - 2.6 Nerve growth stimulation and brain cell protection
  - 2.7 Recreational drugs with purported nootropic effects
  - 2.8 Other nootropics
- 3 Brain foods

- 4 See also
  - 4.1 Brain and neurology
  - 4.2 Thought and thinking (what nootropics are used for)
  - 4.3 Health
- 5 References
- 6 External links

## General strategies

Neurotransmitter support - supplying the body with the precursors and cofactors it needs to produce neurotransmitters.

Note that cardiovascular exercise performed on a regular basis also has nootropic effects, by increasing the body's capacity to supply brain cells with oxygen.

## Nootropic substances

Nootropic drugs are generally only available by prescription or through personal importation. The other nootropic substances listed below are either nutritional supplements or plant components, and are generally available over the counter at health food and grocery stores. The term "drug" here is used as a legal designation, and does not indicate greater efficacy. With nootropics, the effects, effectiveness, and potency differ from substance to substance and from individual to individual. See the substance descriptions below for more detail.

### Replenishing and increasing neurotransmitters

Thinking is a biologically demanding task. It involves the firing of neurons, which requires ample neurotransmitters, and even though these are reusable to some extent, they do get depleted. Depletion of neurotransmitters generally results in reduced mental performance, which may include difficulty concentrating, slowed reasoning, decreased learning efficiency, impaired recall, reduced coordination, lowered moods, inability to cope, increased response times, and mental fatigue. This also generally increases the likelihood of human error on tasks and activities performed. Stress causes neurotransmitters to be depleted even faster. The brain's neurotransmitters need to be replenished frequently, made by the body from substances ingested in the diet. Maintaining neurochemicals at optimal levels has a corresponding effect on brain performance, supporting improved mental agility and stamina, even beyond the individual's normal limits.

As the brain ages, its ability to produce and maintain youthful levels of neurotransmitters declines.<sup>[1]</sup> Thus, the theory is that providing the brain with ample raw materials necessary to make neurotransmitters can restore them to more youthful levels and thus help maintain cognitive function at vigorous youthful levels as well.

## Cholinergics

Cholinergics are substances that affect the neurotransmitter acetylcholine or the components of the nervous system that use acetylcholine. Acetylcholine facilitates memory, concentration, focus, and high-order thought processes (abstract thought, calculation, innovation, etc.). Increasing the availability of this neurotransmitter in the brain may improve these functions and increase the duration in which they may be engaged without slowing down or stopping. Oversupplying the brain with acetylcholine may have the opposite effect, temporarily reducing rather than improving mental performance. Cholinergic nootropics include acetylcholine precursors and cofactors, and acetylcholinesterase inhibitors:

- Acetyl-L-carnitine (ALCAR) - Amino acid. Precursor of acetylcholine (donating the acetyl portion to the acetylcholine molecule). It is synergistic with lipoic acid.
- Centrophenoxine (Lucidril) - Drug. Cholinergic agent, enhances color perception.
- Choline - precursor to acetylcholine (an essential component of the acetylcholine molecule).
  - Alpha-GPC (L-alpha glycerylphosphorylcholine, Choline alfoscerate) - most effective choline precursor, readily crosses the blood-brain barrier.
  - CDP-Choline (Cytidine Diphosphate Choline) - choline precursor, tends to be less expensive and similar in effect to Alpha GPC.
  - Choline bitartrate - precursor of acetylcholine, anti-depressant.
  - Choline citrate - precursor of the neurotransmitter acetylcholine, anti-depressant.
- DMAE - approved treatment for ADD/ADHD, precursor of acetylcholine, cholinergic agent, removes lipofuscin from the brain, anti-depressant.
- Galantamine - acetylcholinesterase inhibitor made from chemical synthesis or extract from plants such as Red Spider Lily (*Lycoris radiata*).
- Huperzine A - potent acetylcholinesterase inhibitor derived from Chinese club-moss.
- Lecithin - contains phosphatidylcholine, precursor of acetylcholine.
- Pyrrolidone derivatives:
  - Piracetam (Nootropil) - Prescription drug (in Europe). The original (first),<sup>[2]</sup> and most commonly taken<sup>[3][2]</sup> nootropic drug. It is a cholinergic agent, synergistic with DMAE, centrophenoxine, choline, and Hydergine. Increases brain cell metabolism and energy levels,<sup>[4][2]</sup> and speeds up interhemispheric flow of information (left-right brain hemisphere communication). Increases alertness,<sup>[5]</sup> improves concentration, and enhances memory. Protects neurons from hypoxia,<sup>[2]</sup> and stimulates growth of acetylcholine receptors. May also cause nerves to regenerate. Piracetam markedly decreases the formation of neuronal lipofuscin.<sup>[6]</sup> It improves posture in elderly people.<sup>[7]</sup> It is not regulated in the US.
  - Aniracetam - Drug. Analog of piracetam, and 4 to 8 times more potent. Like piracetam, aniracetam protects against some memory impairing chemicals, such as diethyldithiocarbamate and clonidine.<sup>[8]</sup> Also like piracetam, aniracetam may enhance memory in aging adults by increasing levels of brain biogenic monoamines, which are beneficial to learning and memory.<sup>[1]</sup> Both

racetams have possible therapeutic use in treating fetal alcohol syndrome.<sup>[9]</sup> Aniracetam increases vigilance<sup>[5]</sup>. Aniracetam has shown to positively potentiate AMPA receptors.

- Etiracetam - It increases vigilance.<sup>[5]</sup>
- Nefiracetam - Drug. Analog of piracetam, and facilitates hippocampal neurotransmission.<sup>[10]</sup>
- Oxiracetam - Drug. Analog of piracetam, and 2 to 4 times stronger. Improves memory, concentration, and vigilance. When fed to pregnant rats, the offspring of those rats were more intelligent than the offspring of rats fed a saline solution placebo.
- Pramiracetam - Drug. Fifteen times stronger than piracetam, of which it is an analog.
- Vitamin B5 - cofactor in the conversion of choline into acetylcholine, cholinergic agent, increases stamina (including mental stamina).

Excess acetylcholine is considered by many to be potentially harmful; see cholinesterase inhibitor.

## Dopaminergics

Dopaminergics are substances that affect the neurotransmitter dopamine or the components of the nervous system that use dopamine. Dopamine is produced in the synthesis of all catecholamine neurotransmitters, and is the rate limiting step for this synthesis. Dopaminergic nootropics include dopamine precursors and cofactors, and dopamine reuptake inhibitors:

- Mucuna pruriens - Seed powder contains high concentrations of levodopa (L-dopa), a direct precursor of the neurotransmitter dopamine.
- L-dopa - Prescription drug. Precursor to the neurotransmitter dopamine, anti-depressant.
- Phenylalanine (requires Vitamin B6 and Vitamin C) - Essential amino acid. Precursor to dopamine, anti-depressant, sleep reducer.
- Theanine - Found in tea. Increases serotonin and dopamine levels in the brain. Increases alpha-wave based alert relaxation.
- Tyrosine (requires Vitamin B6 and Vitamin C) - Amino acid. Precursor to dopamine, anti-depressant, sleep reducer.
- Vitamin C - improves cardiovascular elasticity and integrity, membrane stabilizer and major anti-oxidant (protects brain cells and prevents brain cell death), cofactor in the production of the neurotransmitters dopamine and serotonin.
- Vitamin B6 - co-factor used by the body to produce dopamine.
- Yohimbe - Bark. Boosts dopamine levels as much as 80%, though how it does this is not yet understood. Aphrodisiac. Yohimbe poses some health risks through its side-effects: it is a neuro-paralytic which slows down breathing and induces acidosis, some symptoms of which are malaise, nausea, and vomiting. Contraindicated for users of megadoses of acidic vitamins or nutrients.
- Deprenyl - Inhibits MAO B (an enzyme that breaks down dopamine) thus raising dopamine by partially inhibiting its breakdown.
- Tolcapone - Inhibits COMT (an enzyme that breaks down the neurotransmitters dopamine, epinephrine, and norepinephrine) and increases performance in tasks depending on working memory in individuals with the val/val and val/met genotype of the val158Met polymorphism of the catechol-O-methyltransferase gene, while decreasing it in presence of the met/met version. Tolcapone presents the risk of deadly side effects.

## Serotonergics

Serotonergics are substances that affect the neurotransmitter serotonin or the components of the nervous system that use serotonin. Serotonergic nootropics include serotonin precursors and cofactors, and serotonin reuptake inhibitors:

- 5-HTP - more bioavailable form of tryptophan, precursor to the neurotransmitter serotonin, promotes relaxed poise and sound sleep.
- Griffonia simplicifolia a natural source of 5-HTP (an alternative in countries where 5-HTP not legal, freely available.)
- Tryptophan (requires Vitamin B6 and Vitamin C) - Essential amino acid. Precursor to serotonin, found in high concentration in bananas and poultry (especially turkey), also in milk, promotes relaxed poise and sound sleep.
- 5HT<sub>2A</sub> agonists such as LSD and 2C-T-7 have been shown to produce nootropic effects when used at a dose much lower than a hallucinogenic dose. (e.g. 10 µg for LSD and 1 mg 2C-T-7, 1/25 of a normal recreational dose )
- SSRIs - Class of antidepressants that increase serotonin levels in the brain by inhibiting its reuptake. Have also been shown to promote Neurogenesis in the hippocampus.

### Anti-depression, adaptogenic and mood stabilization

Depression and depressed mood negatively affect cognitive performance. Feelings of sadness, guilt, helplessness, hopelessness, anxiety, and fear caused by depression detract from productive thought, while apathy (which is also induced by depression) is the lack of motivation and driving moods (like curiosity, interest, determination, etc.) Other symptoms include disturbed sleep patterns, mental fatigue and loss of energy, trouble concentrating or making decisions, and a generalized slowing and obtunding of cognition, including memory. Obviously, removing these effects improves intelligence and mental performance, and therefore, counteracting and preventing depression are effective nootropic strategies. There is a high correlation between depression and a reduction or depletion of neurotransmitters (dopamine, acetylcholine, and serotonin) in the brain, therefore it is no surprise that increasing the brain's supply of neurotransmitters alleviates (or at least reduces the symptoms of) most depressions. Stress is another major factor in neurotransmitter depletion, being both a cause and effect of it (creating a vicious downward spiral), therefore stress management and anti-stress substances are also very useful nootropic strategies.

All of the "nergics" listed above have been found to increase stress tolerance and alleviate depression (by replenishing or increasing the brain's supply of specific neurotransmitters), especially when used in precursor/co-factor combinations.

Below are additional more nootropics which affect mood and stress:

- Ashwagandha (*Withania somnifera*) - Root. Also known as Indian ginseng. Adaptogen used as a tonic to normalize body processes and reduce stress and anxiety.
- Inositol - Is a B-vitamin like substance with anti-anxiety effects. It is believed to produce its anti-anxiety effects by improving the binding of gabaergics to GABA<sub>A</sub> receptors. Inositol is a sugar, and is therefore an alternative energy source for brain and muscle tissues. It produces a sugar high without a sugar low, making it especially suited for sweetening tea (instead of sugar). It is also a membrane stabilizer which can strengthen (and therefore help protect) neurons.

- Lemon Balm (*Melissa officinalis*) - Herb. Anti-depressant.
- Rhodiola Rosea - Herb. Adaptogen; elevates mood, alleviates depression. Promotes mental energy and stamina, reduces fatigue.
- St John's Wort - Herb. The active components: hypericin and hyperforin, are clinically indicated to be effective in cases of mild to moderate depression.
- Ginseng, Siberian (*Eleutherococcus senticosus*) - Root. Anti-anxiety adaptogen that normalizes physical stress and mental consequences.
- Selegiline (Deprenyl) - Along with Piracetam and Meclofenoxate, Deprenyl decreases the amount of lipofuscin pigment and ceroid pigment accumulations in the brain by improving cellular recycling activities.<sup>[11]</sup> Therefore, these nootropics may slow age-related diseases in the brain.
- *Sutherlandia frutescens* - Herb. Adaptogen, blood detoxifier.
- Tea - Herb. Contains theophylline and theanine. Increases alpha-wave based alert relaxation (relieves stress).
- Theanine - Amino acid. Found in tea. Increases serotonin and dopamine levels in the brain. Increases alpha-wave based alert relaxation.
- Vasopressin - Drug. Memory hormone produced by the pituitary gland which improves both memory encoding and recall. Rapidly counters chronic apathy syndrome and drug-induced vasopressin depletion.
- Nicotinic acid (vitamin B3) - Essential nutrient. Mild enhancer of concentration and memory. Vasodilator - Mood stabilizer, with a powerful anti-anxiety effect — perhaps the best and most immediate stress reliever available (note that other forms of vitamin B do not have this effect). Side effects: gastric upset (which is easily prevented and relieved with antacids), reduced blood pressure and flushing of the skin (caused by vasodilation), and itchy sensation in the skin caused by histamine release.

## Brain energy and improved oxygen supply

- Acetyl-L-carnitine (ALCAR) - Amino acid. Transports fatty acids through cellular membranes and cytosol into cells' mitochondria, where the fats undergo oxidation to produce ATP, the universal energy molecule. Synergistic with lipoic acid.
- Chromium- stabilises blood sugar levels promoting concentration.
- Coenzyme q-10 syn. Ubiquinone - increases oxygen transport through the mitochondria of the cells. Appears to slow age-related dementia.
- Creatine - increases brain energy levels via ATP production.
- Inositol -
- Lipoic acid - synergistic with Acetyl-L-carnitine.
- Piracetam - improves alertness, blood flow, oxygen supply, and stroke recovery.
- Pyritinol (Enerbol) - Drug. Enhances oxygen and glucose uptake in the brain, and allows glucose to pass more easily through the blood-brain barrier. It is also a powerful anti-oxidant which scavenges hydroxyl radicals created in the very processes it is involved in.
- Vinpocetine - micro-circulation enhancer, improves oxygen supply to brain cells.

## Mental agility, concentration, stamina, and focus

- Adrafinil (Olmifon) - Drug.

- Caffeine - improves concentration, idea production, but hinders memory encoding. Also produces the jitters. Caffeine is the most widely used psychoactive substance in the world, and may be susceptible to strong levels of tolerance.
- Coffee - Bean. Contains caffeine; brewed coffee is high in antioxidants.
- Nicergoline - Drug. Nicergoline is an ergoloid mesylate derivative used to treat senile dementia. It has also been found to increase mental agility and enhance clarity and perception. It increases vigilance.<sup>[5]</sup> Increases arterial flow and use of oxygen and glucose in the brain.
- Nicotine - stimulus barrier (aids in concentration). Stimulus barrier rebound effect (an unpleasant side effect).
- Cocaine - Drug.
- Methylphenidate (Ritalin) - Drug
- Dextroamphetamine - (Adderall, Dexedrine) - Drug.
- Modafinil - (Provigil) - Drug.
- Piracetam - improves alertness, socialization, and co-operation in the brain impaired from age, dementia, and reduced blood flow.
- Phenibut -
- Theophylline -
- Amphetamine -
- Carphedon (Phenotropil) -

### Purported memory enhancement and learning improvement

All of the "nergics" listed above are purported to improve memory (encoding and recall), As do all nootropics which improve general brain performance in categories such as the brain energy and oxygen supply, and nerve growth stimulation and protection. Other agents purported to have these specific benefits are mentioned in their own sections.

Other nootropics with specific effects on memory encoding and recall include:

- *Bacopa monniera* (Brahmi) - Herb. Elevates curiosity, enhances memory and concentration.<sup>[12]</sup> Brahmi also protects against amnesia inducing chemicals such as scopolamine or loss of memory due to electro convulsive shocks.<sup>[12]</sup> It is a traditional ayurvedic medicine.
- Piracetam - improves memory, Alzheimer's, dementia, dyslexia and Down's syndrome
- Rosemary - Herb. Rosemary has a very old, albeit unverified, reputation for improving memory.
- Vasopressin - Hormone, prescription drug.
- Dextroamphetamine- Adderall, Dexedrine.<sup>[13]</sup>
- Nicotine - Improves working memory and learning<sup>[14]</sup>

### Nerve growth stimulation and brain cell protection

- Acetyl-L-carnitine (ALCAR) - Amino acid. Inhibits lipofuscin formation.

- *Bacopa monnieri* (Brahmi) - Herb. Improves protein synthesis in brain cell repair and new dendritic growth.
- Selegiline (Deprenyl) - Drug. Brain cell protectant, delays senescence of brain cells, proven to increase maximum life span in laboratory rats.
- Ergoloid mesylates (Hydergine) - Drug. Mimics nerve growth factor (NGF), and is a powerful anti-oxidant capable of delaying brain death in cases of heart failure and stroke by several minutes with regular use. It increases vigilance.<sup>[5]</sup>
- Idebenone - stimulates nerve growth, and has same effects as Coenzyme q-10 - boosters claim that CoQ10 has "harmful side-effects", a claim which has not been demonstrated in published peer-reviewed studies.
- Inositol - Membrane stabilizer. Strengthens neurons, making them less susceptible to damage.
- Pyritinol (Enerbol) - Drug. Powerful anti-oxidant which scavenges hydroxyl radicals. Also enhances oxygen and glucose uptake in the brain, and allows glucose to pass more easily through the blood-brain barrier. Improves general brain function.
- Rasagiline (Azilect) - Drug. Treats Parkinson's disease either as monotherapy (by itself) or in addition to levodopa therapy. Promotes increased and sustained levels of dopamine by selectively inhibiting an enzyme, monoamine oxidase-B.
- Vitamin C - Membrane stabilizer, involved in collagen synthesis. Strengthens neurons, making them less susceptible to damage. Vitamin C is also a co-factor in the brain's production of dopamine.

## Recreational drugs with purported nootropic effects

See also: *Controlled substances act and Misuse of Drugs Act 1971*

- Amphetamines (Adderall, Dexedrine) - Schedule II / Class B drugs. Prescribed for attention-deficit disorders, narcolepsy, and certain cases of obesity; and issued as an anti-fatigue pill for pilots in the armed forces. These also heighten alertness, mental focus, vigilance, stamina, and sex drive. They are highly addictive, and have many side effects. Personal importation is prohibited. Using these recreationally or for performance enhancement is illegal in most countries.
- Cannabis is reported to heighten the ability of the senses, as well as heighten alpha wave activity in the brain associated with creativity.
- LSD - Schedule I / Class A drug. At minuscule doses (1 µg) the drug has effects similar to Hydergine. At higher doses, the impact of the senses on one's mind are expanded to such an overwhelming degree that what is being sensed seems qualitatively different. Activity in the Raphe Nuclei and Locus Coeruleus increases dramatically following administration of LSD to produce extremely heightened creativity in many users. This effect on the creative process is a phenomenon that may be due to ascending traffic in the reticular activation system, which can result in stimulus overload.<sup>[15]</sup> Also produces hallucinogenic and entheogenic effects at doses as low as 30–40 µg (micrograms), with the likelihood of having a *bad trip* increasing as dose is increased if these effects are undesired. May also cause cognitive shifts, synesthesia, and flashbacks. The drug sometimes spurs long-term or even permanent changes in a user's personality and life perspective. (For more details, see *Albert Hofmann: LSD - My Problem Child* (<http://www.maps.org/books/mpc/index.html>).)
- 4-methylaminorex
- Pernoline
- Psilocybin and Psilocin
- MDPV

- Mescaline

## Other nootropics

- Adafenoxate - Has an anti-anxiety effect for rats<sup>[16]</sup> and possibly the same for humans.
- *Butea frondosa* - "The plant *Butea frondosa* has been indicated in the Indian system of medicine as a plant augmenting memory and as a rejuvenator. ... *B. frondosa* possesses anti-stress and weak nootropic activity."<sup>[17]</sup>
- BMY 21502 - Injured animals treated with BMY-21502 at one week post-injury showed significant improvement in post-injury learning ability compared to injured animals treated with vehicle. Paradoxically, in uninjured control animals BMY-21502 treatment appeared to worsen learning scores. The results of this study indicate that BMY-21502 may be useful for attenuating the dysfunction in learning ability that occurs following TBI.
- Cabergoline (Dostinex) -
- *Celastrus paniculatus* - Herb.
- Cerebrolysin - A neuroprotective nootropic agent, might affect Alzheimer's disease pathology. Currently in clinical trials
- Clausenamide
- Coluracetam - It may also have potential use in prevention and treatment of ischemic retinopathy and retinal and optic nerve injury.
- Desmopressin (DDAVP) - Drug. Analog of vasopressin (the anti-diuretic and memory hormone)
- DHEA - Hormone created by the adrenal glands; Precursor to Estrogen and Testosterone
- Dostinex -
- Fasoracetam -
- Essential Fatty Acids- Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DPA) are the best known. EPA in particular, has an anti-depressant function and is positively indicated in trials with autism and learning difficulties.
- Fipexide (Vigilor) - It protects against some memory impairing chemicals, such as diethyldithiocarbamate and clonidine.<sup>[8]</sup>
- Gerovital H3 -
- *Ginkgo biloba* - Root. Increases blood flow to the extremities and the brain, nootropic effects are disputed.
- Gotu Kola - Herb and root.
- Meclofenoxate - Has an anti-anxiety effect for rats<sup>[16]</sup> and possibly the same for humans. Like Fipexide, it protects against some memory impairing chemicals, such as diethyldithiocarbamate and clonidine.<sup>[8]</sup> Like many racetams, it may treat fetal alcohol syndrome.<sup>[9]</sup>
- Milacemide - Drug.
- Nimodipine -
- Ondansetron -
- Phenytoin (Dilantin) -
- Phosphatidylserine- reduces age-related memory loss and promotes concentration.
- Picamilon or Pikamilone - Compound of Niacin and GABA. It can pass the blood-brain barrier and increase amount of GABA in the brain.

- Pregnanolone - Hormone; Precursor to DHEA;
- Pyroglutamate -
- Sapunifiram
- Semax - A neuropeptide (stimulator of the nervous system) developed from a short fragment of ACTH, Pro8-Gly9-Pro10 ACTH(4-10). Claims of significant increase in salvation of neurons are made
- Somatotropin -
- Sulbutiamine (Arcalion) - Drug - derivative of thiamine (vitamin B1) that can cross the blood-brain barrier and work as anti-fatigue and cognitive support agent.
- Sunifiram
- Unifiram
- Xanthinol -

## Brain foods

Some regular food items are rich sources of substances with alleged nootropic benefits:

- Nuts, in particular walnuts, are rich sources of alpha-linolenic acid (ALA), a type of omega-3 fatty acid. A mixture of walnuts served with dried fruit pieces is known in some regions as student food (orig. German: *Studentenfutter*) and is there popularly recommended as a snack for students and other mental workers.
- Oily fish, such as salmon or fresh tuna (not tuna canned in oil) are also good sources of omega-3 fatty acids such as eicosapentaenoic acid and docosahexaenoic acid, whose lack in diet has been associated with increased risk of mental illnesses such as depression, aggressive behavior, schizophrenia, or hyper-activity in children.

## See also

### Brain and neurology

- Action potential
- Aging and memory
- Brain
- Central nervous system (CNS)
- Dendrite
- Human brain
- Long-term potentiation
- Nervous system
- Neurite
- Neuron
- Neuroplasticity
- Neuroscience
- Neurotransmitter
- Sensory neuroscience
- Synapse
- Synaptic plasticity

- List of nootropics (smart drugs)

## Thought and thinking (what nootropics are used for)

- Abstract thinking
- Attention
- Attitude
- Brainstorming
- Cognition
- Cognitive science
- Creative thinking
- Critical thinking
- Curiosity
- Decision
- Decision making
- Eidetic memory
- Emotions and feelings
- Emotional intelligence
- Goals and goal setting
- Idea
- Imagination
- Intelligence
- Introspection
- Lateral thinking
- Learning
- Memory
- Memory-prediction framework
- Mental calculation
- Mind's eye
- Mindset
- Mood
- Motivation
- Perception
- Personality
- Picture thinking
- Problem shaping
- Problem solving
- Reason
- Recollection (recall)
- Self-reflection
- Thought
- Visual thinking

## Health

- Anxiety
- Cognitive psychology
- Clinical depression
- Confusion
- Cosmetic pharmacology
- Drug
  - Parasympathomimetics
  - Prescription drug
  - Prohibition (drugs)
  - Psychoactive drug (aka psychotropic drug)
- Human enhancement
  - Ergogenic aid
- Life extension
- Neurodegenerative disease
  - Alzheimer's disease
  - Parkinson's disease
- Nutrition
- Sleep disorders
- Stress
- Stress management

- Psychedelic drug

## References

■ Gualtieri, F., Manetti, D., Romanelli, M.N., and Ghelardini, C. (2002). "Design and Study of Piracetam-like Nootropics, Controversial Members of the Problematic Class of Cognition-Enhancing Drugs. (<http://www.ingentaconnect.com/content/ben/cpd/2002/00000008/00000002/art00004>)". *Current Pharmaceutical Design* **8**: 125–38.

1. ^ <sup>a b</sup> Stancheva, S.L., Petkov, V.D., Hadjiivanova, C.I., and Petkov, V.V. (1991). "Age-related changes of the effects of a group of nootropic drugs on the content of rat brain biogenic monoamines. ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=1761194&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1761194&dopt=Citation))". *Gen. Pharmacol.* (Department of Experimental Pharmacology, Bulgarian Academy of Sciences, Sofia) **22** (5): 873–7.
2. ^ <sup>a b c d</sup> McDaniel, M.A., Maier, S.F., and Einstein, G.O. (2002). "Brain-Specific Nutrients: A Memory Cure? ([http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6TB0-4B0KTYF-C&\\_coverDate=12%2F31%2F2003&\\_alid=448998985&\\_rdoc=1&\\_fmt=&\\_orig=search&\\_qd=1&\\_cdi=5128&\\_sort=d&view=c&\\_acct=C000050221&\\_version=1&\\_urlVersion=0&\\_userid=10&md5=f99a155c658f3be9a94cc485fbf37262](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6TB0-4B0KTYF-C&_coverDate=12%2F31%2F2003&_alid=448998985&_rdoc=1&_fmt=&_orig=search&_qd=1&_cdi=5128&_sort=d&view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=f99a155c658f3be9a94cc485fbf37262))". *Psychological Science in the Public Interest* (American Psychological Society) **3** (1).
3. ^ Goldman, R., Klatz, R., and Berger, L. (1999). *Brain fitness*. New York: Doubleday.
4. ^ Gabryel, B. and Trzeciak, H.I. (1994). "Nootropics: Pharmacological properties and therapeutic use. ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=7894524&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7894524&dopt=Citation))". *Polish Journal of Pharmacology* **46**: 383–394.
5. ^ <sup>a b c d e</sup> Saletu, B. and Grunberger, J. (1985). "Memory dysfunction and vigilance: neurophysiological and psychopharmacological aspects. (<http://www.annalsnyas.org/cgi/content/abstract/444/1/406>)". *Annals of the New York Academy of Sciences* **444** (1): 406–27.
6. ^ Paula-Barbosa, M.M., Brandao, F., Pinho, M.C., Andrade, J.P., Madeira, M.D., and Cadete-Leite, A. (1991-10-01). "The effects of piracetam on lipofuscin of the rat cerebellar and hippocampal neurons after long-term alcohol treatment and withdrawal: a quantitative study. (<http://www.blackwell-synergy.com/doi/abs/10.1111/j.1530-0277.1991.tb00610.x>)". *Alcohol Clin. Exp. Res.* **15** (5): 834–8.
7. ^ Riedel, W.J., Peters, M.L., Van Boxtel, M.P.J., and O'Hanlon, J.F. (1998-12-04). "The influence of piracetam on actual driving behaviour of elderly subjects (<http://www3.interscience.wiley.com/cgi-bin/abstract/4292/ABSTRACT?CRETRY=1&SRETRY=0>)". *Human Psychopharmacology: Clinical & Experimental* **13** (S2): S108–14.
8. ^ <sup>a b c</sup> Genkova-Papasova, M. and Lazarova-Bakurova, M. (1988). "Influence of nootropic drugs on the memory-impairing effect of diethyldithiocarbamate and clonidine in "step down" passive avoidance in albino rats. ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=2854355&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2854355&dopt=Citation))". *Acta Physiol. Pharmacol. Bulg.* (Institute of Physiology, Bulgarian Academy of Sciences) **14** (4): 36–41.
9. ^ <sup>a b</sup> Vaglenova, J. and Petkov, V.V. (Feb. 2001). "Can nootropic drugs be effective against the impact of ethanol teratogenicity on cognitive performance? ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=11226810&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11226810&dopt=Citation))". *European Neuropsychopharmacology* **11** (1): 33–8.
10. ^ Nomura, T. and Nishizaki, T. (2000-07-07). "Nefiracetam facilitates hippocampal neurotransmission by a mechanism independent of the piracetam and aniracetam action. ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=10869513&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10869513&dopt=Citation))". *Brain Res.* (Department of Physiology, Kobe University School of Medicine. Kobe, Japan) **870** (1–2): 157–62.
11. ^ Riga, D. and Riga, S. (1995). "Brain lipofuscinolysis and ceroidolysis--to be or not to be. (<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>)?

cmd=Retrieve&db=PubMed&list\_uids=8821338&dopt=Abstract)". *Gerontology* (Institute of Neurology and Psychiatry, Bucharest, Romania) 41 (S2): 271–81.

12. <sup>a b</sup> Singh, H.K. and Dhawan, B.N. (1997). "Neuropsychopharmacological effects of the Ayurvedic nootropic *Bacopa monniera* Linn. (Brahmi) (<http://ijp-online.com/article.asp?issn=0253-7613;year=1997;volume=29;issue=5;spage=359;epage=365;aulast=Singh;type=0>)". *Indian Journal of Pharmacology* 29 (5): 359–65.

13. <sup>a</sup> Rapoport, J.L., Buchsbaum, M.S., Zahn, T.P., Weingartner, H., Ludlow, C., and Mikkelsen, E.J.. "Dextroamphetamine: cognitive and behavioral effects in normal prepubertal boys". *Science* 199 (4328): 560–3.

14. <sup>a</sup> Edward D. Levin, F. Joseph McClernon and Amir H. Rezvani. "Nicotinic effects on cognitive function: behavioral characterization, pharmacological specification, and anatomic localization.". *Psychopharmacology* 184: <http://www.springerlink.com/content/y41lg2qj24xvh31/>.

15. <sup>a</sup> Bacon, et al., "The Effect of LSD on the Human Brain" (<http://www.cem.msu.edu/~cem181h/projects/96/lsd/drug.html>), 1996. Accessed October 16, 2007

16. <sup>a b</sup> Petkov, V.D., Getova, D., and Mosharoff, A.H. (1987). "A study of nootropic drugs for anti-anxiety action. ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=2896427&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2896427&dopt=Citation))". *Acta Physiol. Pharmacol. Bulg.* (Institute of Physiology, Bulgarian Academy of Sciences, Sofia) 13 (4): 25–30.

17. <sup>a</sup> Soman, I., Mengi, S.A., and Kasture, S.B. (2004). "Effect of leaves of *Butea frondosa* on stress, anxiety, and cognition in rats. ([http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list\\_uids=15388278&dopt=Citation](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=15388278&dopt=Citation))". *Pharmacology, Biochemistry & Behavior* (C.U. Shah College of Pharmacy, SNDT University Santacruz, Mumbai, Maharashtra, India) 79 (1): 11–6.

## External links

- Society for the Advancement of Cosmetic Pharmacotherapy (<http://www.circuitblue.com/psypharm/>)
- BetterBrain Nootropics Index (<http://www.betterbrain.org/>)
- Business Week Online - "I Can't Remember" ([http://www.businessweek.com/@@\\*TTz0oUQYsI6ogEA/magazine/content/03\\_35/b3847001\\_mz001.htm](http://www.businessweek.com/@@*TTz0oUQYsI6ogEA/magazine/content/03_35/b3847001_mz001.htm)) September 1, 2003
- CerebralHealth.com (<http://www.cerebralhealth.com/>)
- Slashdot Cognitive Enhancement Drugs (<http://science.slashdot.org/article.pl?sid=04/12/20/2352239&tid=191&tid=14>)
- HedWeb (<http://www.nootropic.com/>)
- Brain Foods (<http://www.becomingssmarter.com/eating-to-your-smartness-part-3>)
- List of Nootropic drugs at Erowid.org (<http://www.erowid.org/smarts/smarts.shtml>)
- The Scientist - Seeking Smart Drugs (<http://www.thescientist.com/article/display/13341/>) by Eugene Russo October 28, 2002

Retrieved from "<http://en.wikipedia.org/wiki/Nootropic>"

Categories: All articles with unsourced statements | Articles with unsourced statements since May 2007 | Articles with unsourced statements since Nov 2007 | Articles with unsourced statements since February 2007 | Articles with unsourced statements since September 2007 | Articles with unsourced statements since June 2007 | Nootropics

---

- This page was last modified 18:58, 1 November 2007.
- All text is available under the terms of the GNU Free Documentation License. (See **Copyrights** for details.)

Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc., a U.S. registered 501(c)(3) tax-deductible nonprofit charity.

**Carphedon** ( $C_{12}H_{14}N_2O_2$ , *2-(4-phenyl-2-oxopyrrolidin-1-yl)acetamide*) is a derivative of the nootropic drug piracetam. It was developed in Russia, and a small number of low-scale clinical studies have shown possible links between prescription of carphedon and improvement in a number of encephalopathic conditions, including lesions of cerebral blood pathways, and certain types of glioma. It is also claimed to increase physical stamina and provide improved tolerance to cold. As a result, it appears on the lists of banned substances issued by the World Anti-Doping Agency. This list is applicable in all Olympic sports. As of 27 February 2006, the most recent case of carphedon abuse by a professional athlete is that of Russian biathlon Olympic silver medalist Olga Pyleva in the 2006 Winter Olympics, who was disqualified from attending further events following a positive drug test. She was subsequently banned from competition for two years. It may be noteworthy that Pyleva claims that carphedon was an unlisted ingredient of a Russian medication she was prescribed by her personal doctor (not a team doctor).

While not widely available in the West, in Russia it is available as a prescription medicine under the brand name "Phenotropil". Packets of ten 100 mg pills are available for roughly 330 rubles (2006 price). It is typically prescribed as a general stimulant or to increase tolerance to cold and stress.

A former rider for Gerolsteiner, professional cyclist Danilo Hondo, tested positive to this banned substance in 2005.

Carphedon	
<b>Systematic (IUPAC) name</b>	
2-(4-phenyl-2-oxopyrrolidin-1-yl)acetamide	
<b>Identifiers</b>	
77472-70-9	
CAS number	( <a href="http://www.nlm.nih.gov/cgi/mesh/2006/MB_cgi?term=77472-70-9&amp;rn=1">http://www.nlm.nih.gov/cgi/mesh/2006/MB_cgi?term=77472-70-9&amp;rn=1</a> )
ATC code	?
PubChem	( <a href="http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=132441">http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=132441</a> )
<b>Chemical data</b>	
Formula	C <sub>12</sub> H <sub>14</sub> N <sub>2</sub> O <sub>2</sub>
Mol. mass	218.3 g/mol
<b>Pharmacokinetic data</b>	
Bioavailability	~100 %
Metabolism	?
Half life	3-5 hours
Excretion	?
<b>Therapeutic considerations</b>	
Pregnancy cat.	?
Legal status	Legal to import
Routes	Oral